

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

By the present amendment, claims 1, 11, and 19 are currently being amended, and claims 3 and 18 are requested to be cancelled. After amending the claims as set forth above, claims 1, 2, 4-17, and 19-21 will be pending in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

I. Rejections Under 35 U.S.C. § 102

Claims 11-17, and 21 stand rejected under 35 U.S.C. § 102(e) as anticipated by, or in the alternative as unpatentable under 35 U.S.C. § 103(a) in view of U.S. 6,083,425, issued to Clawson *et al.* Applicant notes that claim 11 has been amended by the incorporation of former claim 18, shown by the Examiner to be free of Clawson as prior art, and, hence, the grounds for these rejections are now moot. As such, Applicant respectfully requests withdrawal of these rejections.

I. Rejections Under 35 U.S.C. § 102

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II. Rejections Under 35 U.S.C. § 103

Clawson and Maruko

Claims 1-10 and 18-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Clawson, in view of U.S. 6,506,359, issued to Maruko. Applicant respectfully traverses the rejections.

Claim 11 is directed to a fuel processor for generating a H₂ rich gas from a fuel. Claim 11 recites in full:

A fuel processor for generating a H₂ rich gas from a fuel, comprising:

- (a) an inlet projecting through an exterior housing of the fuel processor into a mixing zone, the inlet attached to a steam line and a fuel line;
- (b) an inner reforming zone comprising a sidewall, a first end connected to the inlet, and a second end;
- (c) an inner tube attached to an O₂ rich gas line and at least partially surrounded by the inner reforming zone;
- (d) an outer reforming zone comprising the sidewall of the inner reforming zone, an outer sidewall, a first end connected to the second end of the inner reforming zone, and a second end;
- (e) a cooling zone comprising a first end connected to the second end of the outer reforming zone and a second end;
- (f) a sulfur removal zone comprising a first end connected to the second end of the cooling zone, and a second end; and
- (g) a water-gas-shift zone comprising a first end connected to the second end of the sulfur removal zone, and a second end connected to an outlet of the fuel processor;

wherein the inner reforming zone comprises a partial oxidation catalyst and a steam reforming catalyst or a combined partial oxidation and steam reforming catalyst.

The presently claimed invention allows for fuel, air, and steam to be simultaneously fed in a catalytic reaction zone where the mixture undergoes reforming reactions. Specification page 23, lines 5-10. The inner reforming zone contains partial oxidation catalysts and steam reforming catalysts so that both reactions are accomplished within the same chamber of the fuel

processor. Specification page 23, lines 15-19. As pointed out in the background, fuel cells were known where these chambers were separated (Specification page 3, lines 3-29), however there are problems with separation such as the high temperatures (>1000°C) associated with partial oxidation catalysts (Specification page 12, lines 2-14).

Clawson falls into the later category of fuel processors: i.e. separate partial oxidation and reforming zones. In fact, Clawson states that “[t]hat the reformer includes a first vessel having a partial oxidation reaction zone and a *separate* steam reforming reaction zone that is *distinct* from the partial oxidation reaction zone.” Col. 1, lines 63-66. As such, Clawson cannot be found to anticipate the presently claimed invention as Clawson does not show or describe a fuel processor in which the partial oxidation and reforming zones are combined. Based upon the language quoted above, Clawson does not obviate the presently claimed invention, and in fact, Clawson counsels against the claimed combination by requiring that the zones be separate and distinct.

Presumably, Maruko is cited to remedy the failing of Clawson, the Examiner stating that “it would be obvious from Maruko to include a steam reforming catalyst and a partial oxidation catalyst in the inner zone of Clawson.” However, the explicit requirement, in Clawson that the zones be *separate* and *distinct* thereby teaching away such a combination, and despite any teachings in Maruko, is lethal to the combination of these references. The basis for the rejections lies in Clawson, and as shown, Clawson clearly teaches a separate partial oxidation zone that is distinct from the reforming zone. Thus, Clawson fails to provide any reason to one of skill in the art to combine such zones, and in fact, Clawson explicitly states that it is required that the zones be separate and distinct. Thus, contrary to the Examiner’s statements, Applicant submits that it would *not* be obvious to one of skill in the art to combine the two zones into a single inner reforming zone as is presently claimed.

In view of the explicit teaching away of such a combination in Clawson, Applicant respectfully requests that the rejection on Clawson and Maruko be withdrawn and the application allowed to proceed to issuance.

Clawson and Hwang

Claims 1-10 and 18-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Clawson, in view of U.S. 6,436,363, issued to Hwang *et al.* Applicant respectfully traverses the rejections.

As stated above, with respect to the rejection over Clawson and Maruko, Applicant reiterates their comments with regard to Clawson and Hwang. Clawson explicitly teaches away from the combination of a the partial oxidation and reforming zones, and Hwang, like Maruko, is incapable of curing the requirements for the reactor design of Clawson (i.e., separate and distinct).

Hwang fails to disclose the claimed fuel processor. Hwang does disclose layered partial oxidation and steam reforming catalysts on a substrate, where one layer is on top of another layer, or they may be zoned. Col. 3, lines 48-60. Again, the Examiner has stated that one of skill in the art would have been motivated to combine Clawson and Hwang, stating that “it would have been obvious from such a disclosure of Hwang *et al* to employ a catalyst comprising platinum on gadolinium doped ceria as the catalyst in the inner zone of Clawson. Office Action, page 4.

However, the explicit requirement in Clawson that the reforming zone and the partial oxidation zone defeats any suggestion of using one with the other as the Examiner suggest. Clawson has provided separate and distinct regions and the Examiner’s suggestion to subvert this requirement by combining with Maruko or Hwang, could render Clawson unsatisfactory for its intended purposes contrary to the MPEP 2143.01 (V) (The proposed modification cannot render the prior art unsatisfactory for its intended purpose).

Applicant submits that by Clawson requiring separate and distinct partial oxidation and steam reforming zones, combination to combine the two zones based upon Clawson must fail. Applicant respectfully requests that the present rejections based upon Clawson, Maruko, and Hwang be withdrawn and the application allowed to proceed to issuance.

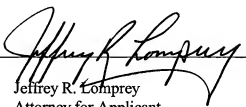
Applicant believes that the present application is now in condition for allowance.
Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a
telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date July 8, 2008

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